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ABSTRACT

Although knowledge of multimeaning words is important for reading comprehension, deaf readers may know only the most common meanings or nuances of high-frequency multimeaning words. Results of a study are reported in which 33 profoundly hearing impaired students stratified into three equal age groups (ages 10, 11, and 12) were administered a 60-item pictorial, multimeaning vocabulary test. Each item contained one target word and five possible responses in the form of contextual illustrations. Results indicated that knowing two meanings proved significantly more difficult than knowing one meaning of the same words. Selecting more than one meaning was not influenced by age, suggesting that deaf students may lack not only an in-depth knowledge of words, but also the ability to use available context clues in deriving word meanings. To enrich vocabulary development, a three-step plan for teaching multimeaning words is described: (1) activate and enrich the students' prior knowledge; (2) develop activities that give students practice in applying newly learned word knowledge; (3) provide opportunities for reading familiar and new words in a wide variety of natural, meaningful contexts. Sample activities are provided to illustrate each step. (JW)

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Deaf Children's Comprehension of Multimeaning Words: Research and Implications

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Abstract

This article discusses the findings of a study on deaf children's comprehension of words with multiple meanings. Based on a review of the literature, it is argued that many deaf students are unaware that a word may have several meanings. This condition reflects an inadequate development of prior knowledge, and may lead to reading comprehension problems. Teachers should be more aware of the prevalence of multimeaning words in reading materials, and should provide direct, instruction in this area. Some teaching techniques that adhere to a classification-concept framework are provided.

Deaf Children's Comprehension of Multimeaning Words: Research and Implications

It is widely accepted that vocabulary knowledge is important for reading comprehension. Some scholars have argued that it is the most important comprehension component (Dale & O'Rourke, 1986; Devine, 1986). In addition to having adequate prior knowledge and metacognitive skills (e.g., problem-solving strategies), good readers know at least one meaning of many different words. Recent research reviews have shown also that good readers know several meanings and nuances of numerous words (Nagy & Herman, 1987; Paul & O'Rourke, in press).

It is not clear why vocabulary knowledge is critical for reading. According to one emerging viewpoint, an extensive and in-depth knowledge of word meanings represents a sum of prior, structured knowledge (i.e., schema) that is stored in readers' heads. When readers know a word, they know a number of meanings, nuances, and related concepts. That is, readers know not only individual word meanings, but also the conceptual frameworks elicited by word meanings. It is this storehouse of knowledge that enables them to comprehend reading materials. In essence, prior knowledge about a topic, especially knowledge of key words, has been shown to be one of the best predictors of reading comprehension ability (e.g., Johnston & Pearson, 1982).

The importance of knowing several meanings of multimeaning words cannot be overemphasized. Beginning readers encounter many basic sight words and other words with multiple meanings such as back, can, and run. For example, Searls and Klesius (1984) studied first grade basal word lists and found that almost 90% of these words have more than one meaning. In addition, Johnson, Moe, and Baumann (1983) reported that approximately two-thirds of the words that appear most frequently in the spoken and written language and in the reading materials of young children in the primary grades are multimeaning words. Thus, to become effective readers, students may need to know not only the primary or common meanings, but also the secondary or less common meanings of the words that appear in print.

There is no question that deaf students' vocabulary knowledge is inferior to their hearing peers, and that they acquire new words at a slower rate (see review in Paul, 1984). It appears that deaf students have difficulty learning meanings of words via reading only. One reason for this is that they may have poor word identification skills. For example, the students may not be able to use available sentence clues to figure out the meaning of a word.

There is also some evidence that (1) many deaf adolescents have difficulty with the notion that a word may have several meanings, and (2) knowledge of words, including multimeaning

words, is related to reading comprehension scores (LaSasso & Davey, 1987; Letourneau, 1969; Paul, 1984). Much of what we know about multimeaning words and deafness has come mainly from research on hearing-impaired students in residential and day schools. For example, Paul (1984) conducted a study using profoundly hearing-impaired students from age 10 to 18 years, 11 months, and normally hearing students from 8 to 10 years, 11 months old. On a picture vocabulary test, both groups of students selected the primary meanings of words more often than the secondary meanings. In addition, the researcher found that selecting two meanings was more difficult than selecting single meanings of the same words. Finally, for the deaf students, selecting two meanings of words was influenced by their reading ability but not by age.

In short, little evidence exist on the knowledge of words with multiple meanings by deaf students, especially those students in special classrooms in public school settings. In addition, guidelines for instruction in multimeaning words have not been reported in the literature on hearing-impaired students. The present article has two major purposes (1) to report the results of a study that assessed the comprehension of two meanings of multimeaning words by deaf students in special education classes in public schools, and (2) to provide implications to teachers for the teaching of word meanings. In relation to the first purpose, it was of

interest to answer the following questions: (1) Is there a difference between knowing at least one meaning and knowing two meanings of the same words, and (2) Is there an effect of age on the subjects' scores on the multimeaning test? To accomplish the second purpose, the researcher presents examples of teacher-directed, theory-based instructional techniques that may help to extend students' depth in word knowledge. It is emphasized that the intent of the activities is not only to teach additional meanings of words, but also to expand students' knowledge of concepts and nuances related to the words. Finally, recommendations are offered to assist teachers in the use of reading materials that contain numerous multimeaning words.

Method

Subjects

Thirty-three profoundly hearing-impaired students from several educational programs in one school district in Ohio (United States) participated in this study. The students were stratified into three equal age-groups (1) 10;00 to 10;11 years, (2) 11;00 to 11;11 years, and (3) 12;00 to 12;11 years. As much as possible, several factors were considered in creating homogeneous groups, for example, gender, race, reading ability, and type of education program, that is, Oral (speaking only) or Total Communication (speaking and signing simultaneously). The ratio of Oral to TC students in each

age-group was about one to three. It should be noted that most of the TC students had been enrolled previously in Oral programs in the same school district.

The deaf students met the following criteria: (1) hearing impairment was 90 dB or greater (ANSI, 1969) in the better unaided ear averaged across the speech frequencies (500, 1000, and 2000 Hertz); (2) hearing impairment occurred prior to the age of three years; (3) both parents had normal hearing; (4) students had at least average intelligence on the performance scale of a standardized instrument; and (5) students had no other apparent educational disabilities.

Instrument

The instrument, constructed by the present investigator, was a picture, multimeaning vocabulary test containing sixty words. High reliability coefficients have been reported for both hearing and hearing-impaired students (Paul, 1984). Each item contained one target word and five possible responses in the form of contextual illustrations. Forty-five of the items require two correct responses and the remaining 15 require one correct response. Examples of test items can be found in the appendix.

The format of the instrument was deemed appropriate due to the low reading achievement levels of deaf students. Several other formats were considered, for example, presenting words

in isolation, phrases, and sentences and requiring the students to select either the best synonym, antonym, definition, or description. These were rejected because of the increased vocabulary and syntactic demands they place on the students (Quigley, Wilbur, Power, Montanelli, & Steinkamp, 1976).

The selection of the test stimuli was based on two criteria (1) a word had at least one or two meanings that could be illustrated clearly, and (2) a word was within the 10,000 frequency level (Carroll, Davies, & Richman, 1971). The selected words and corresponding meanings were at the grade-four level, the lowest grade level with available data (Dale & O'Rourke, 1981).

Procedures

The examiner distributed booklets and pencils. The instructions were written in the booklets and were read (and/or signed) by the examiner. Students were asked to complete two examples, one requiring one correct response and the other, two correct responses. Their answers were checked to ensure that the required task was understood. The students were tested in groups of four or five. No time limits were imposed.

Results

Comprehension of Two Meanings of High-Frequency Words

The *t* test for correlated measures was used to determine

if there were significant differences between knowing at least one meaning and knowing two meanings of the 45 words requiring two correct responses. Significant t values were obtained for all age-groups, from youngest (10;00 to 10;11 years old) to oldest (12;00 to 12;11 years old); t (10) = 16.94, 14.98, and 13.54, $p < .001$. Thus, knowing two meanings of multimeaning words was significantly more difficult than knowing at least one meaning of the same words.

Effects of Age

It was of interest to determine whether the scores of the students within each group improved significantly with age. That is, as students become older, do they acquire additional meanings of the same words? The means and standard deviations of the age-groups, from youngest to oldest, are: $\bar{X}$ = 19.5, S = 12.3; $\bar{X}$ = 23.0, S = 7.7; and $\bar{X}$ = 22.7, S = 11.8. The results of an analysis of variance indicated that there were no effects of age; F (2, 28) = .26. Thus, the scores of the deaf students within the three age-groups did not significantly improve as the students become older.

Discussion and Implications

Based on the results here and those of other studies cited previously, it is possible to conclude tentatively that many hearing-impaired students have difficulty with the notion that a word may have several meanings. The persistent finding that selecting more than one meaning of words was not influenced by

age suggests that deaf students not only may not have an in-depth knowledge of words, but also may not have the ability to use available context clues in deriving word meanings.

Because most contexts may reveal little useful information about word meanings, readers need to compensate by engaging in extensive and broad reading experiences. Many poor readers, including deaf readers, however, do not read widely either inside or outside the classroom setting. Thus, direct, systematic vocabulary instruction may be necessary to help them become independent word learners which, in turn, enables readers to learn more words via reading. The use of context clues has been shown to be most effective when it is reinforced by teacher-directed vocabulary instruction and teacher-student discussions of word meanings and related concepts (e.g., Stahl, 1986).

Vocabulary Instruction

There needs to be a move away from what has been labeled the definition-and-sentence approach to a conceptual or classification approach (Paul & O'Rourke, in press). Typically, the focus has been on what a word means (i.e., most common meaning) and how it can be used in a sentence. Instead, attention should be given to the entire conceptual framework elicited by the word. That is, vocabulary instruction should help students acquire new words or concepts and a deeper knowledge of old words and concepts by bridging

what the students do not know with what they do know. As stated by Pearson (1984, p. 16), instead of asking "What is it the children do not know and how can I get that into their heads?" we should ask "What is it that the children do know that is enough like the new concepts so that I can use it as an anchor point?" Some techniques for achieving this end are semantic mapping, semantic feature analyses, and other forms of semantic elaboration such as word analogy and word mapping or webbing (for a description of these approaches, see Heimlich & Pittelman, 1986, and Johnson & Pearson, 1984).

Obviously, no one vocabulary approach will work effectively with all students. The classification-concept approach may have differential effects depending on the individual needs of the students. Within this approach, however, many students may learn words and related words via the suggesting, modeling, correcting, and elaborating of the teacher. The critical role of the teacher as an active participant in these techniques cannot be overemphasized.

Three-Step Plan

In relation to teaching multimeaning words, a three-step plan has been proposed (Paul & O'Rourke, in press) based on important points stated elsewhere (e.g., Johnson & Pearson, 1984; Stahl, 1986). First, the teacher should activate and enrich the prior knowledge of the students via words and related concepts. Next, the teacher should develop activities

for students to apply their newly-learned knowledge of the words. Finally, students should have sufficient opportunities to read old and new words in a wide variety of natural meaningful contexts. Each step is presented below, with the discussion augmented by some examples of teaching strategies.

As mentioned previously, students' prior knowledge can be enriched and activated by a number of classification activities, for example, word analogy and semantic webbing (or mapping). Semantic webbing is selected here as an example. There are many variations of this technique. The focus here is on multimeanings of words in a variation called word mapping or webbing (Paul & O'Rourke, in press).

Suppose, the teacher has decided that bank (as in the bank of the river) is a very important multimeaning word in a story that the students are going to read. During prereading activities, the teacher should discover what students know about the word bank, that is, meanings, nuances, associations, and related concepts. Ask students questions such as Does anyone know what this word means? If no response, follow with Do you save money, Where do you put it, Is that a safe place? Then, Where do some people keep their money, Why? By this time, both teacher and students may generate additional questions such as What is a bank used for, Can you name different kinds of banks, and Can you save or store other things in a bank? What the students know about the word may be used as a starting point.

Because additional meanings of bank (and many other common multimeaning words) are likely to appear in other stories, the teacher should provide opportunities for students to acquire the meanings, nuances, and related concepts. For example, students should be asked: Can you think of another meaning for bank, What else is called a bank, Does anyone know the name of a strip of land along the side of the river (show picture)? Then, Where else can you find a bank near water (try to elicit canal, stream, brook)?

The activity above can be illustrated in a word-concept web (a kind of semantic map). The teacher categorizes the students' suggestions, and then, encourages them to construct labels for the categories (see Figure 1). Finally, it is

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Insert Figure 1 about here

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important for the teacher to explain to the students why they are doing this activity. Teacher and students should also discuss the concepts in the categories and the relationships among them. It is often forgotten that the discussion of the activity by teacher and students is as important as the activity itself.

In sum, word-concept and other classification activities may require a good portion of teacher preparation and classroom time. The teacher's objectives and students' needs

and abilities should dictate the extent of the activities. It has been argued, however, that these techniques may be effective for activating and enriching the students' prior knowledge, vocabulary, and other comprehension skills that are important for reading.

During Step 2 of the three-step plan, students should perform tasks that help them to use and expand what they have learned. They should use words that have already been introduced and taught. For example, the teacher can show students pairs of sentences such as (1) Mary put her money in her piggy bank, and (2) Jose sat on the bank of the river. The main purpose of this activity is to help students develop a mind set for diversity of word meanings. In addition, students need to learn to apply their prior knowledge about words and related concepts. They also may need to figure out what they do not know, and learn strategies to resolve the problem. A suggested line of questions for teachers to ask might be: What is the meaning of bank in the first sentence, Are there other places where you can save money; followed by, Did you notice that bank in the first sentence is different from bank in the second sentence, What is the difference , Can you think of another meaning for bank, and Where can we find other meanings of this word? Finally, it may be possible for the teacher to elicit or introduce metaphorical usages of bank as break the bank and you can bank on that.

Another technique is to require students to solve riddles, problems, or dilemmas. Teacher and students can develop interesting and challenging puzzles. The following is an example from Paul and O'Rourke (in press):

> I am a container. I am also a building.
>
> I may hold money, blood, food, or clothes.
>
> What am I? _____

The few activities presented here are not meant to be definitive. A number of other theory-based techniques could be generated by teachers, students, and researchers. It is difficult to determine experimentally which specific technique is most effective for improving vocabulary and reading comprehension for all students. The techniques suggested here, however, do provide opportunities for students to use and expand their knowledge. It is important to emphasize, again, that in using any activity the teacher needs to find out what the student knows so that new concepts can be linked to old, familiar concepts.

Step 3 states that the student needs to read, read, read. Deaf students should be encouraged to read extensively within, and, especially, outside the classroom. It is important that they be guided to materials that they can read. The materials should contain multimeaning words that are used in a wide variety of contexts. In addition to sharing their stories with the class, students can be required to list all the

multimeaning words they found, tell the meaning of the words as used in the stories, give additional meanings that they know, and ask the rest of the class for other meanings and nuances.

It should be clear that knowledge of multimeaning words is important for reading comprehension. Knowledge of word meanings means knowledge of not only individual meanings of words but also the entire conceptual framework that may surround the words, including nuances and metaphorical usage. Deaf readers may know only the most common meanings or nuances of high-frequency multimeaning words. To enrich their vocabulary development and prior knowledge, and to help them apply what they know, a concept approach to vocabulary instruction is suggested.

The following recommendations may be helpful for teachers in using reading materials that contain words with multiple meanings (from Paul & O'Rourke, in press).

1. First, read the passage. Determine which words in the story have more than one meaning.

2. Decide the importance of these words. For example, ask yourself, Which words are crucial to students' comprehension of the story? Do these words appear often in this story and the rest of the book?

3. Determine if most of your students can derive the meanings of the words from context.

4. List the aspects of the words that your students need to know. For example, should they know other nuances and related concepts such as idiomatic usage? Will this knowledge help them to understand important concepts in this story and subsequent stories?

5. Finally, find out what students know about the words. If instruction is necessary, try to use techniques such as semantic mapping and others that emphasize depth, as well as breadth, of word knowledge (e.g., see sources such as Dale & O'Rourke, 1986; Heimlich & Pittelman, 1986; Johnson & Pearson, 1984; and the special issue of the Journal of Reading, 1986). Use what the students know as a starting point.

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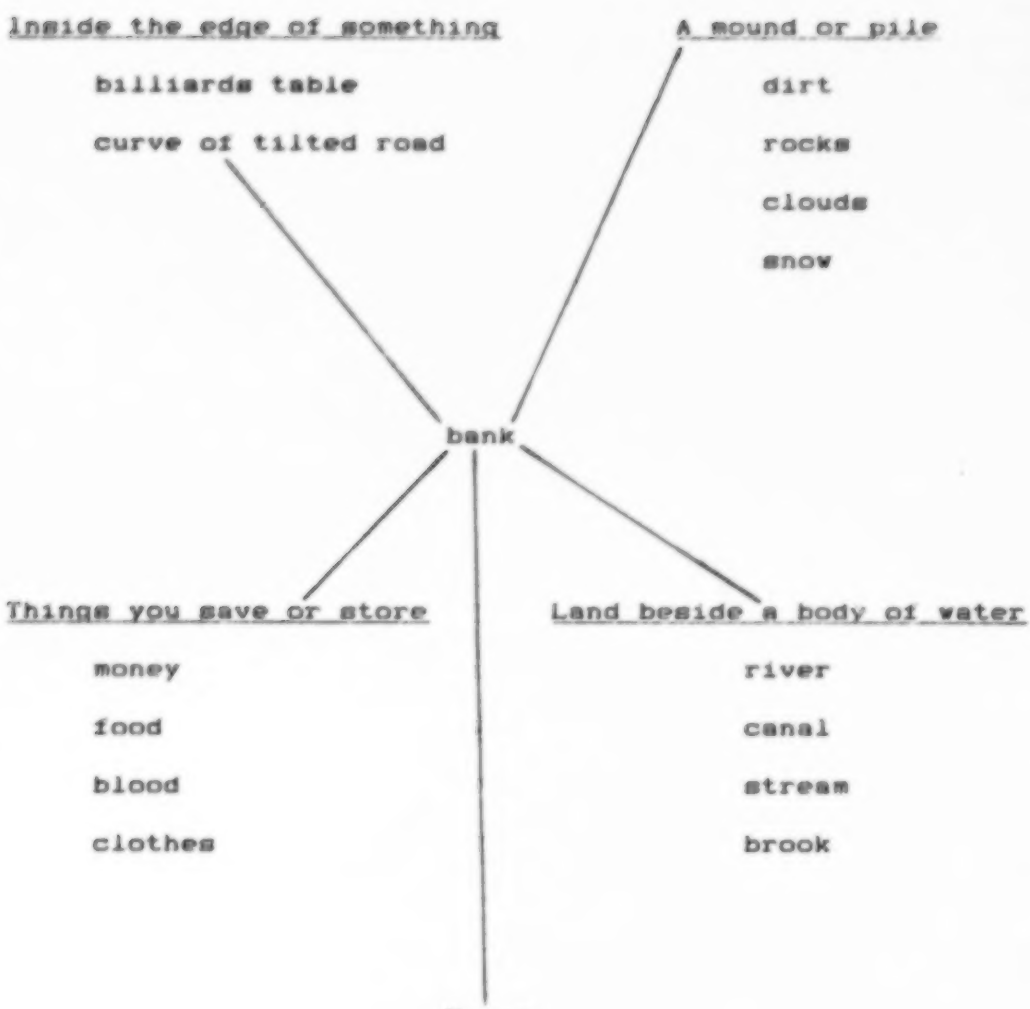
Figure Caption

Figure 1. Word Web for bank.

Appendix

Sample Items from the Test of Words with Multiple Meanings

(Illustrated by Mary E. Pilewski Paul)

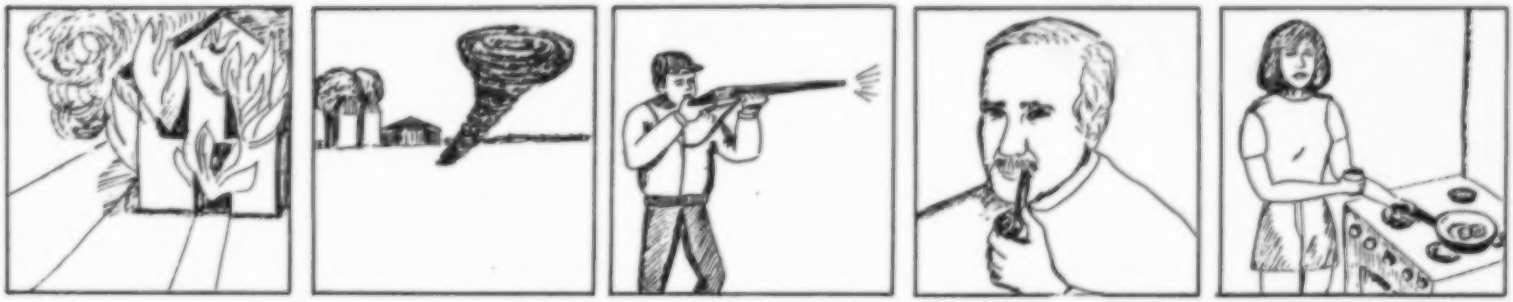


Note: Students can be asked to create phrases or sentences that express the various meanings of bank (Paul & O'Rourke, in press).

3. weave

A B C D E

4. fire



A B C D E